MEDICINE TODAY

This department of California and Western Medicine presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to every member of the California, Nevada and Utah Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

The Specific Gravity of the Urine.—The specific gravity of the urine is an accurate measure of the number of dissolved particles within it. The greater the urinary volume, the lesser the concentration of the dissolved particles, and hence the lower will be the specific gravity. A normal kidney will respond to forced fluid intake by the elaboration of urine with a specific gravity as low as 1:001. The specific gravity of water being 1:000, it is evident that such urine contains very few dissolved particles. If the volume of urine is decreased, the dissolved substances will be more concentrated, and the specific gravity of the urine will be high. If the amount of water brought to a normal kidney is sufficiently decreased through any cause (e. g., decreased intake, loss of fluid by vomiting or diarrhoea, retention of fluids in the tissues in edema, etc.), a urine with a specific gravity of at least 1:026 will be excreted.

Normally, the waste products are concentrated many times on their passage from blood to urine. Urea, for example, has a "concentration ratio" of 65; uric acid, of 30; creatinin, of 35. In renal impairment, the concentrating ability of the kidney for all the urinary constituents is early decreased. This means that under no circumstances can a urine be elaborated in which the waste products are as highly concentrated as they may be normally. The specific gravity determination offers an easy method of directly measuring their concentration, and hence the functional capacity of the kidney. Thus a simple test may be evolved which yields a maximum of information with a minimum of laboratory equipment and discomfort to the patient. It is necessary that the urinary volume be small enough to insure the highest concentration of dissolved solids which the kidney under suspicion can effect.

Fishberg recommends the following procedure: The patient takes his usual supper, containing about 200 cubic centimeters of fluid, at six o'clock on the evening preceding the test. After this he neither eats nor drinks until the test is completed. Before retiring, the bladder is emptied and the urine discarded. On awakening in the morning he voids, and keeps the urine in a separate container. One hour later the bladder is again emptied, and yet a third specimen is obtained one hour after this, if possible. This completes the test. If there is no renal impairment, the specific gravity of at least one of the specimens will reach 1:024 or higher. In severe renal insufficiency the values will not exceed 1:010, while in intermediate instances figures between these limits will be found. However, three factors must be considered as possibly influencing the results: (1) If edema is being evacuated, the specific gravity may be lowered because of a larger urinary volume. (2) Cardiac weakness often causes nocturnal polyuria which may influence the result in the same manner. (3) Albumen in the urine may cause high specific gravity values. If the albuminuria is over 0.5 per cent, correction should be made by comparison with a prepared table (see *Journal of the American Medical Association* 94, 1885, June 14, 1930); if under that, it may be disregarded.

Certain axioms of diagnostic import may be stated:

1. In spite of increased values for nitrogenous substances in the blood, if the urine has a specific gravity of 1:026 or more (corrected for albuminuria if over 0.5 per cent), renal function is unimpaired.
2. A urinary specific gravity of 1:020 or over makes the diagnosis of uremia very doubtful under any circumstances.
3. In cardiac decompensation, the blood chemistry values may be increased, and the urine contain albumin and casts. If the urine, however, has a high specific gravity, the diagnosis of nephritis is not justified.

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Dermatological Progress.—The 1930 meetings of the American Dermatological Association were held in Cleveland. Of the many interesting papers was one by Doctor Stokes, which brought out clearly the relationship between gastro-intestinal conditions and various skin diseases. His subject covers part of his studies, including the consideration of the effect of emotion on the skin by way of its action on various visceral nervous circulatory and other biologic mechanisms.

"The patient whose digestive tract has reacted to nervous stress and in doing so has established repercussions in his skin, is not ideally treated unless side by side with the corrective measures just described; he is dealt with as a personality problem." Stokes closed his remarks by stating: "The larger our experience and the more careful our search the more we are inclined to believe that in the urticarias and urticarial dermatitides of middle life, in the diathetic eczemas and rosacea, and even in dermatoses which, like epidermatophytosis, seem far removed from psychologic considerations, the tension make-up, the personality defect, the conflict and anxiety, the repression

and the complex, have their places as causal influences, to be sought out and rectified side by side with, and sometimes even before, the correction of the more apparent physical dysfunctions."

Another interesting paper was that of Carroll S. Wright on "Nonspecific Therapy in Dermatology." This included a comprehensive discussion of *autohemotherapy, milk proteins, nonspecific vaccines* and *turpentine.* Autohemotherapy as an adjunct to local therapy in psoriasis has been found to be of definite value. It is also useful in certain cases of chronic urticaria. Milk preparations are useful at times in furunculosis and carbunculosis; also in some types of itching dermatoses. In eczema, acne, and psoriasis they have been distinctly disappointing. Nonspecific vaccine therapy is of some value in psoriasis—a streptococcus fecalis—*Bacillus coli* vaccine being recommended for office use when a mild nonspecific action is desired. Turpentine injections are of value in the treatment of trichophyton infections and certain bacterial infections. Way has been using turpentine by injection for several years in treating, successfully, such cases.

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Hypertonic Glucose Solutions for the Relief of Increased Intracranial Pressure.—That it is possible to lower the cerebrospinal fluid pressure by the intravenous injection of hypertonic solutions was demonstrated by Weed and McKibben and Weed and Hughson.[1 2] The first practical application of this fact was shown by Haden, using concentrated solutions of glucose. The same results, though less pronounced, were shown by Cushing and Foley[3 4] by the oral or rectal administration of sodium chlorid solutions. Later, Fay found that the intestinal administration of magnesium sulphate was twice as efficient as sodium chlorid for the reduction of intracranial pressure. This is explained by the fact that magnesium sulphate is nondialyzable and sodium chlorid is readily so. He also demonstrated that the continued administration of sodium chlorid may produce a secondary wave of edema and increased intracranial pressure due to its absorption and immobilization in the tissues with a subsequent attraction of fluid from the blood stream.

Howe,[5] in an effort to determine what hypertonic solutions were least toxic and most efficient in lowering intracranial pressure when given intravenously, tested a dozen or more substances. Some were found too toxic and others ineffectual. He found that sodium chlorid produced the most pronounced decrease in intracranial pressure of any substance used, but is toxic unless given very slowly. He also found, as did Fay, that due to absorption of the salt in the tissues, there was a secondary wave of edema and an increase in intracranial pressure. He found that dextrose was absolutely nontoxic and never resulted in the slightest disturbance of respiratory or cardiac action, no matter how much or how quickly it was given. Fifty cubic centimeters of a 50 per cent solution given in less than a minute had no untoward effect. He concludes "that dextrose is the only substance of this group which is nontoxic and produces a satisfactory fall in intracranial pressure." The practical application of this fact for the relief of increased intracranial tension as applied to head injuries and intracranial tumor is obviously most valuable.

In the treatment of acute head injuries, hypertonic solutions play an important rôle whether or not surgical interference is undertaken.[6] Hypertonic glucose solution may be used as an aid to decompression in the reduction of cerebral edema, or in cases in which expectant treatment is adopted, it may by the reduction of intracranial pressure, render operation unnecessary. In the milder cases of concussion in which surgical interference is not indicated, it tends to promote recovery and diminish the tendency to sequelae. The treatment of head injuries by hypertonic glucose solution is a rational form of therapy, taking the place of magnesium sulphate which has been employed in a similar rôle for several years.

The indications for the employment of the hypertonic solutions in cases of intracranial tumor are chiefly for diagnostic purposes, as an emergency method of treatment, and for palliation. A patient suffering with a brain tumor, not uncommonly is in a semi-comatose condition when first seen. Several intravenous injections of 50 per cent glucose solution may be sufficient to restore consciousness, thereby making a complete examination, and localization of the tumor possible. If a patient with a brain tumor suddenly becomes comatose, an intravenous injection of a hypertonic solution may reduce the intracranial pressure sufficiently to enable operation to be done. Lastly, in cases awaiting operation or in inoperable cases the headaches and vomiting are often relieved by the use of hypertonic solutions.

The points in favor of the use of 50 per cent glucose are:

1. Its hypertonicity; reducing intracranial pressure.
2. Its small bulk.
3. Its usefulness in combating shock.
4. Its lack of untoward effects.
5. The rapidity with which it may be given.
6. Its food value.

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1 Weed, L. H., and McKibben, P. S. Pressure Changes in the Cerebrospinal Fluid Following Intravenous Injections of Solutions of Various Concentrations. Am. J. Physiol., 48, p. 512, May 1919.

2 Weed, L. H., and Hughson, W. Systemic Effects of the Intravenous Injections of Solutions of Various Concentrations with Especial Reference to the Cerebrospinal Fluid. Am. J. Physiol., 58, p. 53, November 1921.

3 Cushing, H., and Foley, F. E. B. Alterations of Intracranial Tension by Salt Solutions in the Alimentary Canal. Proc. Soc. Exper. Biol. & Med., 17, p. 217, 1920.

4 Foley, F. E. B. Clinical Uses of Salt Solutions in Conditions of Increased Intracranial Tension. Surg. Gynec. Obst., 33, p. 126, August 1921.

5 Armour, Donald. Some Considerations on Head Injuries, Brain, 51, p. 427, December 1928.

6 Brain, W. R., and Strauss, E. B. Recent Advances in Neurology. Philadelphia, P. Blakiston's Sons & Co., 1930, second edition, p. 100.